WITH QUEENS AND ROOKS.

THE INTERESTING SITUATION IN THE INTERNATIONAL TOURNAMENT.

HOW THE LEADERS ARE BUNCHED—DETAILS OF GAMES IN THE SECOND ROUND—CORRESPONDENCE, ETC.

By the time the readers of The Tribune see these comments, the records of two weeks' play in the international chessmasters' tournament will have been given. What must most forcibly strike those who have been watching the progress of these contests is the fact that from eight to ten contestants have always been bunched together—that is to say, one point, at other times even only one-half point, being the difference in the scores of the leaders.

At noon yesterday the results of two games played in the twelfth round were known in this city, namely, that Showalter had beaten Tschigorin and that Steinitz went down before his old-time adversary, Winower. The message, however, also contained the news that Pillsbury would in all probability be beaten by Schiffers, while Lasker found in Albin a Tartar. When the race is such a close one it is difficult indeed to say anything appropriate on the subject. Who knows what will happen when seven additional rounds have to be played, the more so as there is a field rarely seen in an international contest.

It is intended to present a summary in to-morrow's issue, when a table will be given showing with whom the leaders will have to play in the seven final rounds.

Appended is another selection of games, as played in the second round of the tournament, on July 21:

SECOND ROUND—RUY LOPEZ.

WHITE. Schlechter.	BLACK. Pillsbury.	WHITE. Schlechter.	BLACK. Pillsbury.
1 P—K 4	P—K 4	22 R x R	B x P
2 Kt—K B 3	Kt—Q B 3	23 Q x P	B—B 5
3 B—Kt 5	Kt—B 3	24 Q—R 4	P—B 4
4 P—Q 4	P x P	25 B—B 2	B—B 3
5 Castles	B—K 2	26 Q—B 6	B—Q
6 R—K	P—Q R 3	27 R—Q	Q—K 3
7 B—R 4	P—Q Kt 4	28 Kt—Kt 5	B x R P
8 B—Kt 3	P—Q 3	29 R x P	R x R
9 B—Q 5	B—Q 2	30 Kt x R	P—R 3
10 Kt x P	Kt x B	31 Q x P	B—Q 4
11 Kt x Kt	B x Kt	32 Q—B 8 ch	Q x Q
12 P x Kt	B—Kt 2	33 Kt x Q	R—K 8
13 P—Q B 4	Castles	34 Kt—Q 6	B x P
14 Kt—B 3	P x P	35 Kt—Kt 5	R—Q 2
15 Q—Q 4	Q—Q 2	36 Kt—Q 4	K—B 2
16 Q x B P	Q R—K	37 Kt—Kt 3	P—Kt 3
17 B—K 3	P—K B 4	38 B—Q 4	B—R 6
18 B—Q 4	B—Q	39 B—B 5	B—Kt 7
19 P—B 4	Q—K B 2	40 B—Q 4	B—K 3
20 Q—Q Kt 3	B—R	41 B x B	B x Kt
21 Q—R 4	R x R ch	Drawn.	

SECOND ROUND—RUY LOPEZ.

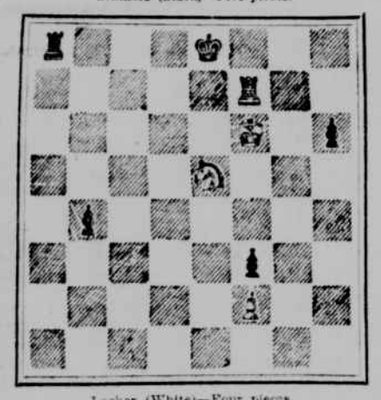
WHITE. Teichmann.	BLACK. Steinitz.	WHITE. Teichmann.	BLACK. Steinitz.
1 P—K 4	P—K 4	25 P x P	P x P
2 Kt—K B 3	Kt—Q B 3	26 P—B 3	B—K 3
3 B—Kt 5	B—R 4	27 Q x P	Castles Q R
4 Castles	Q—Kt 3	28 Q R—Q	Q—Kt 2
5 Kt—B 3	K Kt—K 2	29 Kt—Q 6 ch	B x Kt
6 P—Q 3	Kt—Q 5	30 P x B	K R—Kt
7 Kt x Kt	B x Kt	31 Q—Q 2	Q—Kt 6
8 Kt—K 2	B—Kt 3	32 Q—B 2	P—R 6
9 P—Q B 3	P—B 3	33 Q x Q	R x Q
10 B—R 4	P—Q 4	34 R—B 2	R—R
11 P x P	Kt x P	35 K—R 2	Q R—Kt
12 Kt—Kt 3	P—K R 4	36 Q R—Q 2	K—Q 2
13 B—B 2	B—Kt 5	37 P—Kt 4	P x P
14 Q—K	P—R 5	38 R x P	R x P
15 Kt—K 4	Q—K 2	39 R x R	B x R
16 P—K R 3	B—Q 2	40 P—Kt 5	B—Q 4
17 P—R 4	P—R 4	41 B—Q	R—R 6
18 B—Q 2	P—B 3	42 P x P	P x P
19 K—R	P—Kt 4	43 K—Kt	K x P
20 P—Q 4	B—B 2	44 K—B 2	P—K 5
21 B—Q B 4	Kt—Kt 5	45 K—K	K—K 4
22 B x Kt	P x B	46 R—Q Kt 2	P—K 6
23 P—B 5	P—Kt 5	47 B—B 2	K—Q 5
24 P x K P	B x P	48 Resigns.	

SECOND ROUND—P—Q 4 OPENING.

WHITE. Lasker.	BLACK. Schiffers.	WHITE. Lasker.	BLACK. Schiffers.
1 P—Q 4	P—Q 4	26 P x Kt	R—K 7
2 Kt—K B 3	B—Kt 5	27 K—Kt 3	R x Kt P
3 Kt—K 5	B—B 4	28 R x P	K—Kt
4 P—Q B 4	P—K B 3	29 Kt x B P	P—Kt 4
5 Kt—K B 3	P—K 3	30 R—Kt 5	B—Q 6
6 Q—Kt 3	P—Q Kt 3	31 Kt—Q 7 ch	K—B 2
7 Kt—B 3	P—B 3	32 Kt—K 5	B—K 5
8 P—Q R 4	Kt—Q R 3	33 P—B 5	R—K 7
9 P x P	K P x P	34 P—B 6	B—R
10 P—K 4	P x P	35 P—B 7	K—Q 3
11 B x Kt	P x Kt	36 B—Kt 8	K—K 2
12 Castles	B—Q 3	37 K—B 4	B—Q 4
13 B—Kt 7	B x P ch	38 R—Kt 7	R—R
14 K x B	Q—B 2 ch	39 K—Kt 5	P—R 3 ch
15 P—Kt 3	Q x R	40 K—B 5	B—K 3 ch
16 R—K ch	Kt—K 2	41 K—Kt 6	B—B
17 B—B 4	Castles Q R	42 R—K Kt 1	P—Kt 5
18 P—R 5	Kt—Kt 3	43 P Queens ch	K x Q
19 P x P	Q x P	44 K—B 6	B—Kt
20 Q x Q	P x Q	45 R—K 7	B—R 2
21 R—R 7	B—Q 2	46 R x B	K—Kt
22 K R—R	R x R	47 B—Kt 7 ch	K—B
23 R x R	R—K	48 R—Kt 7	R—Q R
24 P—Q 5	P x P	49 R—B 7 ch	K—K
25 Kt x P	Kt x B		

POSITION AFTER BLACK'S 49TH MOVE.

Schiffers (Black)—Five pieces.



Lasker (White)—Four pieces.

Lasker now announced mate in six moves, as follows:

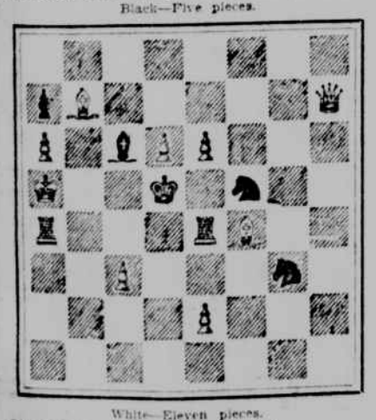
1 B—K 7 ch	K—Q	4 K—K 6	R—R 2
2 Kt—B 7 ch	K—B	5 R x R	any move.
3 Kt—Q 6 ch	K—Q	6 R—Q 7 mate.	

SECOND ROUND—RUY LOPEZ.

WHITE. Schallopp.	BLACK. Walbrodt.	WHITE. Schallopp.	BLACK. Walbrodt.
1 P—K 4	P—K 4	19 P—R 4	Kt—R 4
2 Kt—K B 3	Kt—Q B 3	20 K—R 2	Q R—Kt
3 B—Kt 5	P—Q R 3	21 Q x P	Q—B 3
4 B—R 4	Kt—B 3	22 R—B 3	R—R
5 Kt—B 3	P—Q 3	23 Q—B 4	B—B 3
6 P—Q 4	P x P	24 R—B 2	Q R—K
7 Kt x P	B—Q 2	25 Kt—B	R—K 5
8 B x Kt	P x B	26 Q—R 6	B—R
9 Castles	B—K 2	27 R—K 2	Q—K 3
10 Q—Q 3	P—B 4	28 B—K 3	Kt—B 3
11 K Kt—K 2	Castles	29 Q—R K	Kt—Kt 5 ch
12 Kt—Kt 3	Kt—K	30 K—Kt	B—B
13 Kt—Q 5	B—K R 5	31 Q—Q 3	P—Q 4
14 P—K B 4	B x Kt	32 P—B 3	P—Q 5
15 P x B	P—B 4	33 P x P	P x P
16 Kt—K 3	P x P	34 P—B 5	Q—K 4
17 Q x P	Kt—K B 3	35 B x P	R x R
18 Q—B 4 ch	K—R	36 Resigns.	

PROBLEM NO. 143—BY V. MIESES, LEIPZIG.

Black—Five pieces.



White—Eleven pieces.

White to play and mate in two moves.

CORRESPONDENCE.

Solution to No. 142: Kt—Q 5.

Correct solutions received from J. S. B., jr., New-York; Theodore W. Benedict, jr., New-Canaan, Conn.; Dr. A. H. Baldwin, Norwalk, Conn.; E. W. E., Brooklyn, who also solved No. 141; J. A. McCreery, Brooklyn; the Rev. Louis H. Bähler, West Hurley, N. Y.; W. H. C., Brooklyn; S. S. Morgan, Middletown, N. Y.; H. H. St. Clair, jr., New-York; Harold S. Demerritt, New-Canaan, Conn.; Amateur, New-York; C. T., Hoosick Falls, N. Y.; Samuel S. Wakeman, New-Canaan, Conn.; Alain C. White, New-York, who also solved No. 141.

Additional correct solutions were received to No. 140 from R. W. Burns, Yankton, and S. A. Barbour, Hecla, Mont.; to No. 141 from Dr. H. W. Fannin, Hackett, Ark., and R. L. Coursen, New-York.

A. R. M., Bailey Island, Me.—A King must not move in check, even if the piece threatening the King could not legally take that piece.

THE WEEK AT MANHATTAN BEACH.

IT WILL BE A BUSY ONE, WITH LOCKHART'S ELEPHANTS AND OTHER FEATURES TO ENTERTAIN.

George Lockhart has in preparation a new feature with his elephants that will be a treat to the patrons of Rice's Circus Carnival at Manhattan Beach. For some time he has been teaching Molly and Boney to bowl at tenpins, and they have acquired a proficiency that would excite the envy of a turnverein expert. Molly, when she is about to deliver the ball, takes a slight step forward and leans to one side, a typical movement with all bowlers. She is also versed in the various ways of applying the "English" to a ball. Boney's method is different, and decidedly original. She evidently does not care to assume any of the well-known poses of delivery, but simply picks up the ball and throws it straight ahead, with an accuracy that is surprising, as she seldom fails to have the satisfaction of noting the downfall of one or more pins. Waddy's duties consist of setting up the pins and placing the balls in the return groove, all of which she does with more alacrity than the average "alley boy." About an hour is given to practice each day, and Mr. Lockhart says there are only a few little details that he wishes to perfect before introducing this feature to the public, which is to be in the near future.

Several tournaments are set down for this week at Manhattan Beach. On Monday afternoon at 3 o'clock David Abrahams, the African monkey of "Evangeline," will have a catch-as-catch-can wrestling match with the first trombonist of Sousa's Orchestra. This will be followed by a swimming match between Violet Potter, the prettiest girl of the "Evangeline" company, with a music critic, who enters the list anonymously under the name of the "Williamsburg Wonder." After this contest is decided, Deyo, the famous dancer, will execute a "pas seul" on the diving float and challenge all comers to a jig in the surf.

On Tuesday at 11 o'clock the long prepared-for bicycle race between Rice and Sousa will come off. This contest will not take place, as is generally expected, on the bicycle track, but on the moor behind the hotels. The impresario and handmaster are scorchers of such high degree that, once started on the smooth bicycle course, nothing could stop them in time for the afternoon performance, and to obviate this difficulty they have decided to race across to Sheepshead Bay and back. As the moor is marshy, with frequent ponds and puddles, Sousa has equipped his bicycle with spoon oars and a rudder, while Rice will have a balloon with parachute attachment to carry him over bad places. This will be an interesting race, a sort of steeplechase over land and water between the devil and the deep sea.

On Wednesday the "Evangeline" nine will meet the Mystic Shrine nine on a hitherto bloodless field, and arrangements are being made to have the rival teams brought back in ambulances. Pain's fireworks will chronicle the balls in this wonderful match; the catcher's gloves will be lined with bombs, the pitcher will throw green fire and the bases will be illumined by Roman candles. During the progress of the game DeWolf Hopper, with a helmet of rockets on his head, will execute feats on the tight wire, reciting "Casey at the Bat."

Not to be outdone in this Manhattan Olympiad, George Fortescue has challenged Boney to a fat men's walking race. The Lockhart elephant is the heavier of the two, but she must carry weight for age, inasmuch as the Catherine of "Evangeline" is the youngest person that ever escaped the Gerry society for stage performances. This tournament will be held on Thursday afternoon, and Boney and the comedian are now in training for it. What with these and other contests the week at Manhattan Beach promises to be an exciting one.

PRINCESS MAUD'S WEDDING.

THE BRIDE'S SIMPLE TASTES RULED.

NOTES ON THE CEREMONY—THE WEDDING PRESENTS AND THEIR DONORS.

The young English Princess's wedding was less imposing than most royal ceremonials of the kind have been, but that was quite in accord with her own taste. She is a lively, simple-hearted, fun-loving girl, with no [illegible] for court pageantry. The simplicity of her [illegible] is shown in her new home, Appleton Hall. She has furnished it very plainly, and largely with the exceedingly practical possessions of her maiden days—her sewing machines, typewriters, music boxes and carving tools. A good many of the adornments she has made and carved herself. She playfully calls Appleton her "lowly cot."

The chapel in which the wedding ceremony took place is plain to the last degree, but its severity was hidden under a mass of beautiful flowers and plants. "The Queen," of London, notes that the bride looked somewhat pale, but perfectly composed, and a smile passed over her face as she recognized the friends who were standing near. She wore an exquisite veil of lace, which fell around her in graceful folds, with a few orange blossoms arranged in her hair; a row of pearls encircled her throat, and a lovely bouquet completed the costume." "The Queen" adds:

The eight bridesmaids formed a most interesting group. Princess Victoria of Wales was evidently struggling with emotion as the time approached for the sisters to part. Prince Charles's two sisters are pleasing-looking maidens. Princess Victoria of Schleswig-Holstein was one of the elder bridesmaids, followed by the four children, who were immensely admired. Princess Margaret and Patrica of Connaught are remarkably pretty, as is their cousin, Princess Alice of Albany, while the last, and in this case least, of the group was the five-year-old Lady Alexandra Duff, who looked somewhat alarmed at the part she had to play. The costumes worn by the bridesmaids were red and white, in compliment to the Danish Prince. The dresses will be found among our illustrations. The elder Princesses wore scarlet geraniums in their hair, with a small white plume of ostrich feathers. The headdresses for the younger children were small garlands of red geraniums and their scarlet bouquets of carnations were tied with white ribbon. The Duchess of York, in bright mauve, followed Princess Frederick of Schaumburg-Lippe, and so the procession swept on at a somewhat quick pace until the spectators caught sight of the Princess of Wales, radiant as ever, with a dress of pearl-white satin, veiled in glittering tulle, which sparkled as she moved along, leaning on the arm of her brother, the Crown Prince of Denmark. On reaching the chapel the Princess greeted Her Majesty with the affectionate reverence always shown by the royal family. The sweet voices of the choristers heralded the advent of the bridegroom, and every one was loud in his praise of the manly dignity with which he ran the gauntlet and passed the ordeal of that march along the corridor. His good looks were the theme of conversation, and as his two brothers (supporters) walked a few paces behind him it was a trying time for any young man. The Prince wore the simple uniform of the Danish Navy, with the ribbon of the order conferred upon him by Her Majesty.

The service now proceeded, and the mutual vows registered, a few impressive words from the Archbishop of Canterbury, and with another hymn and the concluding prayers, the ceremonial was over, and the bridegroom led his bride away, both radiant with smiles as they passed along to the Bow Library, where the register was signed in the presence of Her Majesty, and attested by royal signatures. The Queen left the chapel directly after the royal procession had gone, and remained for a short time in conversation with her relatives before returning to her private apartments.

Her Majesty, dressed, of course, in mourning, was looking very well, though somewhat infirm; but years have not robbed her of any of that grace and dignity for which Queen Victoria has been renowned. Her Majesty wore many diamonds, and the bright red ribbon of the Order of the Garter across her shoulder, with other family and foreign orders.

A mere detailed list of the marvellous wedding presents received by Princess Maud and Prince Charles scarcely gives any idea of their magnificence and of the interest which surrounds some special object in the collection, which fairly dazzled the eyes of the visitors who have been admitted during the last few days. Several intimate acquaintances were asked by the Princess, at the garden party, to come and see them on Monday. At one end of the large dining-room set apart for the presents stood a high jeweller's glass case, in which the tiaras, necklaces, bracelets, rings, brooches, etc., were placed. The Queen's gift to her granddaughter was a necklet composed of single stones. Rubies and diamonds alternate, and each stone a picked gem of great beauty. There were three different tiaras. One, from the Prince and Princess of Wales, of particularly elegant design in diamonds and pearls. Another, presented by the several ladies, headed by the Marchioness of Salisbury, is convertible into necklet or tiara. The parure of turquoise and diamonds, given by the bride's brother and sisters, with the Duchess of York and Duke of Fife, is also arranged to be worn in the hair. Innumerable bracelets of all kinds and of great beauty attracted the eye, and the size of a diamond, set in a bangle and presented by Mr. Astor, was most remarkable. The Crown Prince and Princess of Denmark gave a single-stone diamond necklet. Prince Charles gave his bride, among many other things, a very unique antique diamond brooch; and the turquoise in the centre of a large brooch of fine brilliants is pronounced by experts as one of the most perfect gems in the collection. Plate of every description has been presented to the royal couple, and there is not a single thing wanting, from teaspoon to centre pieces, in the plate chests. The artistic talent of Countess Feodora Gleichen is seen in the exquisite statuette of the Princess of Wales. Great interest was felt in a very curious old case containing a fine diamond necklace which had been bequeathed to the Princess "on her marriage" by the Duchess of Inverness, who stood sponsor at her baptism. Laid by for twenty years, it now comes forth again to deck the bride. The dark green morocco dressing bag, given by the Princess, is perfect, so compact, yet complete with every requisite and fitted in beaten gold. Prince Charles received a smaller bag from the Prince of Wales. Specimen plates and cups of various breakfast, dinner, breakfast and tea services were much to be admired, as were two sets of table glass; that given by the Prince and Princess of Wales is enriched with colored jewelling so much the fashion. The enormous Spode china vase given by the Queen to Prince Charles is a lovely specimen of porcelain art. To some presents a mournful interest is attached for the donors have passed away, a beautiful study in oils from the late Lord Leighton and a diamond ornament from Baron Hirsch among them. Many beautiful pieces of furniture are among the gifts, and these have mostly been sent to Norfolk. Carriages have been given by the Prince of Wales's household, by the inhabitants of Lynn and of Norwich; fans with monograms in diamonds, pictures, books, and knick-knacks of every description swell the list to an enormous length, while umbrellas, parasols and whips are not omitted. Her Majesty's present to Prince Charles is a high and very beautiful vase.

THE ROYAL WEDDING—MARRIAGE CEREMONY.

PRINCESS MAUD IN HER BRIDAL DRESS.

THE AMERICAN INSTITUTE FAIR.

The American Institute Fair, which will open at the Madison Square Garden on September 28, continuing until October 29, promises to be one of the best that the Institute has given for many years. As there has been no exhibition since 1892, the reappearance of the well-known industrial exhibition this year in the Madison Square Garden is an important event to the inventors and manufacturers. Preparations for the exhibition began several months ago, and the fair will be free from features that have been unpopular in similar exhibitions.

On the main floor there will be shown in active operation machinery making asbestos cloth, the manufacture of shoes, the manufacture of hand-made writing paper, silk weaving, and motors employed for various purposes, from launches to household machinery. Among the novelties will be a horseless carriage made sufficiently light and yet strong enough to be little heavier than the ordinary road wagon. The bicycle manufacturers will also be in competition for American Institute awards. The Humber people have already secured good spaces, and other firms are looking for exhibits in competition for the Institute awards. In the machinery department, downstairs, gas engines and high-speed engines will be on exhibition, with working machinery of all kinds, including much adapted to farm purposes. The shafting and rapid-running engines will be on the Twenty-sixth-st. side. Farming utensils will also be exhibited in this department, and incubators will have a showing, with good chance for the little chicks.

In the concert hall, beginning with October 5, there will be a special exhibition of flowers, fruits and vegetables, under the direction of the Committee on Agriculture, and the meetings of the Farmers' Club and other associations interested in agricultural matters will be held in the assembly room during the fair. An exhibit of homing pigeons, from October 17 to 24, will be given in the assembly room, and a flight of birds contesting for medals for speed and distance will be made every day from the tower of the Garden under the direction of the race agent of the American Rules, of Philadelphia. The exhibition will be a popular show, at a popular price of 25 cents admission, and there are busy people at the offices of the Institute, No. 113 West Thirty-eighth-st., answering questions and arranging details to take care of the old exhibitors, who are enthusiastic, and the new exhibitors, who welcome the Institute back again to encourage manufacture and invention.

THIS YEAR'S SOLAR ECLIPSE

WHERE, WHY AND HOW OBSERVED.

VISIBLE ONLY IN NORTHERN EUROPE AND ASIA—NATURE OF THE CORONA—CURIOUS INSTRUMENTS.

The moon, as it revolves around the earth, gets almost exactly between the latter and the sun every twenty-nine and one-half days, but it is usually just a trifle too high or too low to pass directly in front of the sun. But next Saturday (as time is calculated on the American continent) the three bodies will be in a direct line, and consequently the moon will completely conceal the sun from a portion of the earth's inhabitants for a very brief period of time. The event will be visible, however, only on the other side of the globe from us; and Sunday will have begun by that time over there.

Shadows are larger than the object which casts them if the source of light be smaller. But the moon's shadow will be much smaller than the moon itself, because the illuminating body (the sun) is vastly larger than the obscuring body. The diameter of the one is about 860,000 miles, and that of the other about 2,000. The patch of darkness falling on the earth's surface, therefore, will not be more than 200 miles across, and this will go rushing along at a rate estimated at between one and two miles a second.

So skilful are astronomical mathematicians that they are able to compute the precise path which the moving shadow will take. Unless the observer is placed within the prescribed limits, of course, he will either see the eclipse as a partial one or not at all. The belt of totality begins over the ocean away up north of Great Britain, sweeps eastward across Northern Norway and the island of Nova Zembla, then curves down slantwise across Siberia to Yezo, one of the northern islands of Japan, and out into the Pacific Ocean. So rapidly will the moon's shadow whisk along that even at the centre of its path the total eclipse will last only one minute and forty seconds up in the Arctic circle, and in Yezo scarcely more than two minutes. These figures, it must be remembered, represent only the complete obscuration of the sun. Nearly or quite an hour will elapse from the moment when the observer detects the moon's disc first encroaching upon the sun's, like a black plate slowly slipped over a white one, until the one entirely hides the other. And another hour will be consumed by the gradual uncovering.

More than a dozen parties of professional scientists and countless amateurs will have placed themselves along the route with the hope of witnessing, sketching and photographing the phenomenon. Several popular excursions by steamer will go to Bodo, a town on the west coast of Norway, up in latitude 67½. Most of the British astronomers will encamp on the shores of Varanger Fjord, a mountain-girt bay, piercing the coast a little east of North Cape, and reaching westward. This is in latitude 70, where, for a part of the summer, the sun never sets, but simply goes round and round, dipping closer to the northern horizon than to the southern. Russians will have posts of observation in Nova Zembla, at the mouth of the river Obi, and also on the Lena and Amoor rivers. At least four parties—two from America, one from England and one from France—will conduct operations in Yezo. As between the two ends of this line, the Norwegian has the advantage of better weather probabilities than the Japanese. It is more convenient of access, too, to scientists from Western Europe. But the eclipse will be of shorter duration. Again, owing to the very high latitude and the early hour, the sun will not be more than one-sixth of the way up from the horizon to the zenith at Bodo and Varanger Fjord. At the first of these places totality should occur at about 4:30 a. m., local time, and at the second a little after 6 o'clock; whereas in Yezo it would happen not far from 3 p. m. It will not take the moon's shadow more than an hour and three-quarters of actual time, probably, to travel from Bodo to Yezo, but, owing to the difference in longitude, clocks in Japan are about seven and a half or eight hours ahead of those in Norway. At 3 o'clock in the afternoon at this time of year in Northern Japan the sun is a trifle more than one-third of the way up from the horizon. This is a much more advantageous elevation, owing to the impurities in the terrestrial atmosphere through which all astronomical observations must be made, than that at which the sun will be observed in Norway.

For a long time there were two solar phenomena which could be observed only during a total eclipse. One was that thin sheet of rosy gas, mostly hydrogen, which overlies the luminous cloudshell of the sun. But the chromosphere, with the huge, fantastic and ephemeral protuberances which rise up out of it, can now be seen and even photographed at other times, owing to the recent discovery of the proper methods. Attention is directed almost exclusively during an eclipse, therefore, to the corona, a hazy white envelope, irregular in shape, sometimes reaching out to the distance of nearly a solar diameter from the edge of the solar disk, but gradually fading in brightness from its inner to its outer boundary. At that stage of the eleven-year period when sun spots are abundant the corona is usually much more extensive than when the spots are small and scarce; from which it is inferred that some of its material is supplied by the explosive, electric or other activity in the denser mass of the sun, to which the development of the spots is usually attributed. The precise nature of the forces which seem to throw up dust and heated gases into the coronal regions and their mode of action are not yet fully understood. In fact, it is mainly to the study of those problems that strictly scientific observation is devoted on those rare occasions when the corona can be seen. The eclipse of April 16, 1893, occurred at a maximum stage of spottedness. Since that time there has been a great falling off in solar activity, although we have not yet reached the minimum. The corona ought, therefore, to exhibit modest proportions next Saturday. But size is of less account than structure. Dark rifts in the corona may still break it up here and there into tufts and streamers, which, by their general direction and curvature, will indicate whether they rise from the equatorial or the polar regions of the sun.

The principal work done will be photographic in character. A sharp watch will be kept for faint hints of the corona both before and after totality; and at these times, as well as during complete obscuration, many amateurs will make rough sketches of the outline and proportions of what they see. But such drawings, even when made by trained astronomers, often disagree enough to be untrustworthy. In 1893, to be sure, four great streamers were distinctly seen, reaching out from the moon's edge, which did not appear in any photograph. Nevertheless, the chief reliance is placed on the record made by the sun itself with the aid of a regular camera, or a telescope converted into one. These instruments will vary in aperture, focal length and other features, but will have a common purpose.

Among the new instruments to be used on this occasion is a glycerine clock, made for the Amherst College expedition in Japan. Its mission is to regulate the movements of a big platform so that twenty or twenty-five cameras, telescopes, spectroscopes and polariscopes mounted on the latter will all gradually change their aim as the sun crosses the sky. Professor Todd will also use an entirely automatic electrical mechanism which alternately exposes and changes the photographic plates with great rapidity. Professor Schaeberle, of the Lick Observatory, also in Yezo, has taken along a now famous telescope with which he gets wonderfully large and delicate photographs. The arrangement of his apparatus will be changed so that his plate-holder, instead of the lens, will shift its position as the sun moves. Mr. Burckhalter, an Oakland (Cal.) astronomer, who accompanies the Lick party, will try for the first time an appliance designed to offset the intensity of the inner part of the corona, so that details will be as distinctly shown in that region as further out. Some observers and photographers, instead of changing the direction in which their instruments point, will keep them stationary, but will reflect the sun's image into them by means of mirrors which are suitably moved by clockwork. Mirrors have been used in very nearly the same way before. When one reflects a star it is called a "siderostat"; when it is used in solar work it is called a "heliostat." But hitherto the machinery has only rocked the mirror in one particular way. It has been found, however, that in order to correct the tendency of the image to revolve on the mirror itself another motion is also requisite. A device provided with clockwork which will perform both these functions is called a "coelostat." This is a French invention, perfected by M. Lippmann, and will be tried by several of the European observers this year for the first time.

Another curious if not very novel instrument used by certain European astronomers is called a "prismatic camera." Its principle will be readily understood by first recalling the arrangement and conduct of an ordinary spectroscope. Light from any given source is admitted into the latter through a narrow slit, and then passes through a lens, a prism and finally a small telescope. Owing to the dispersive or analytical influence of the prism, a number of parallel images of the slit are presented to the eye, those at one end of the series being red, and those at the other being violet. The intermediate lines of the rainbow are represented between these extremes. The whole assortment of lines, be they few or many, constitute the "spectrum" of the substance or commingled substances from which the light proceeds. Now the spectra of solar prominences and of the corona, as formed by a slit spectroscope, can be and are photographed during eclipses. But suppose the slit and the first lens be omitted, and the rays fall directly on the prism. This should be a rather thin wedge, and would be situated just outside the large lens of this little telescope. For the eyepiece a sensitive plate would be substituted. For all practical purposes we would now have a camera, with a prism in front of it. If, therefore, at the moment of totality, when there is just a thin pink chromospheric ring around the obscuring moon, this prismatic camera is brought into operation, we would get a singular photograph. Instead of a series of straight lines, there is obtained

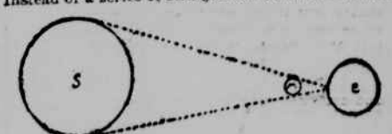
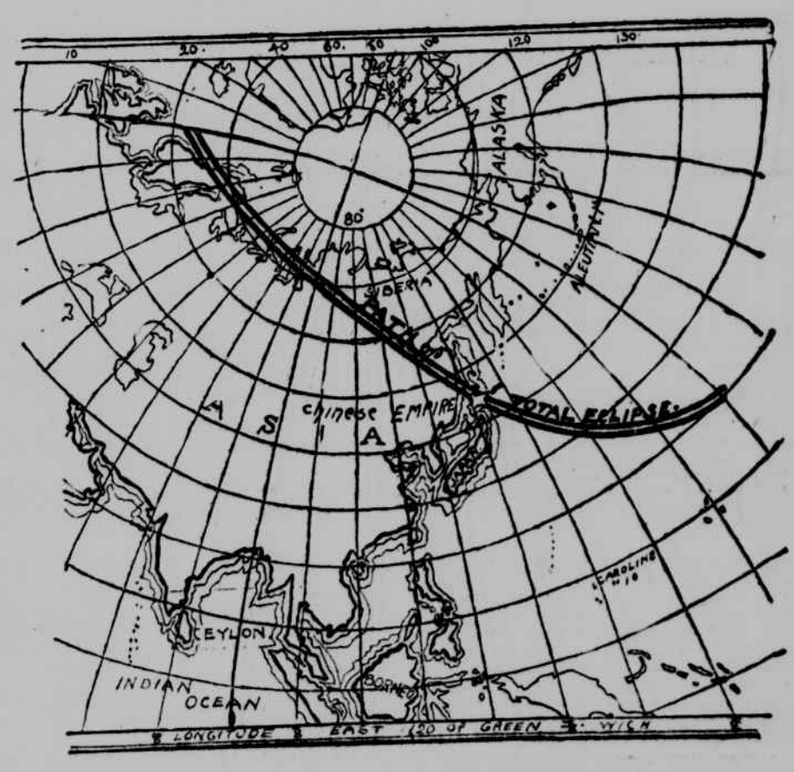


DIAGRAM SHOWING MOON'S SHADOW.

a set of rings arranged in a row, but so close together as to overlap. The spectrum of the chromosphere does not usually show lines of much besides hydrogen and calcium; and consequently these rings are few in number, and occur at just those places where the straight lines would usually occur. They correspond with the lines, too, in intensity; and the outer edge of each ring would exhibit properly shaped and correctly placed excrescences wherever at that moment prominences rose up out of the chromosphere. Mr. Fowler, an English astronomer, obtained a great many pictures of this kind in April, 1893, in co-operation with Norman Lockyer, the distinguished spectroscopist. He and others intend to use prismatic cameras again this year. The spectrum of the corona, as well as that of the chromosphere, has been photographed, with rings instead of lines, by the same means.

It is a generally accepted belief that if a volume of glowing gas be moving rapidly toward the observer, its characteristic lines will be slightly displaced toward one side in the spectroscope, whereas if the mass be moving away the lines will be displaced in the opposite direction. Proceeding on this theory, the French astronomical spectroscopist Deslandres tried in 1893 to ascertain how rapidly (if at all) the corona moved toward us, on one edge of the sun, and how fast it moved away from us on the other. He was led to believe that the velocities corresponded exactly with the sun's rate of rotation. This would indicate that the solar sphere, instead of slipping through its coronal envelope, carries the latter along with it as it turns on its axis, just as the earth does its atmosphere. The Frenchman means to repeat his observations on the present occasion because the case is not yet fully proven.

Photographs taken during the eclipse of 1893 at widely separated stations (along the path of totality (in Chili and South Africa), and representing differences in actual time of two or three hours, were compared subsequently with a view to detecting differences in coronal outlines. If anything of this sort could be clearly established it would show that very rapid changes are liable to occur in the outermost appendage of the sun, precisely as they do in the prominences. The latter sometimes shoot up to a height of 100,000 or 200,000 miles in less than an hour, and subside quite as quickly. Thus far, however, nothing of the kind has been observed in regard to the corona; but if good pictures are secured both in Norway and Japan this year, the looked-for evidence may yet be found. Of course, in an hour and a half the rotation of the sun (which turns once on its axis in about twenty-six days) would hardly be enough to afford much change of aspect; but it is possible to conceive of a great white coronal streamer being suddenly formed by explosive action within an hour or two. A discovery of this sort would throw a great deal of light on the nature of that mysterious solar envelope, on which so much scientific attention is just now concentrated.



WHERE THE COMING ECLIPSE WILL BE VISIBLE.

AIR-MOTOR STREETCARS IN SERVICE.

THEY RUN ON SCHEDULE TIME AND ARE CROWDED WITH ADMIRING PASSENGERS.

Two of the three air-motor streetcars recently received by the Third Avenue Railroad Company from the American Air Power Company were run across town, in One-hundred-and-twenty-fifth-st., for regular passenger traffic yesterday. The first one left Fort Lee ferry at 11:43 a. m. with President E. A. Willard of the Air Power Company, Robert B. Dall, inspector of the railroad company, and Robert Hardie, the inventor, on board. Mr. Hardie controlled the mechanism and gave instructions to several selected grimpen of the railroad company in operating the motor. The first car was soon followed by the second one, and both were successfully run on schedule time from the Hudson to the Harlem River until 9 p. m., when they were housed for the night. They attracted much attention and their handsome appearance was much admired. They were crowded with passengers, many of whom seldom ride in streetcars. All were surprised at the steady and almost noiseless running of the cars.

The same two cars will be run one-half of today, during the hours when there is the least rush of traffic, and the third one will be put into service with them to-morrow.

Fate's Perversity.—"I can't help being a little melancholy," he said, apologetically.

"In trouble?"

"Not on my own account. But I can't help thinking over the misfortunes of two friends of mine who recently married. One got a girl who can cook and insists on playing the piano. The other got one who knows how to play the piano and insists on cooking."—Washington Star.